

# An E-Learning System for Instructional Innovation in Online Courses

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## Abstract

MOOC (Massive Open Online Courses) as a business model has failed to disrupt well established higher education institutes. However, its low cost, easy access and flexibility has shaken the foundation of traditional, lecture-based pedagogy still commonly found in today's campus. Many colleges and universities address the MOOC challenge by offering limited number of online courses. However, research has showed that the students in online classes generally perform worse than their counter parts in in-person classes measured by learning outcomes, which raises the question on the learning effectiveness of online courses.

The main contributor of the disappointing outcomes of such online courses is that they simply replace face-to-face interactions with online media without careful redesign of instruction materials and teaching methods. Research showed that learning outcomes can be improved by providing students instructional materials suitable for online courses, such as web-based, interactive textbooks (Bolsen et al 2016). However, instructors are discouraged to do so by two main reasons: the required effort and lost ownership. The effort required to develop and maintain effective online course materials is several times higher than that for in-person courses (Ariely, Dan. 2013). Many instructors resist adopting standard or "star" instructional design worrying about losing the spirit of creativity and the art of teaching uniquely developed in their professional career.

To address those problems, this project proposes an e-learning system for online courses. The theoretical foundation of the system is built on pedagogy research in adaptive learning, experiential learning, gamification of learning, data analytics and machine learning. The system can dynamically tailor the course materials and learning paths to the learning style of individual student. The circular experiential learning model of think-act-reflect combined with multimedia and interactive course materials helps sustain the intrinsic learning motivation of the student, while gamification enhances the extrinsic learning motivation. It provides a collaborative platform to encourage instructors to contribute to the course materials, collaborate in instructional design, and become the owners of the learning system. The effectiveness of the instructional design can be dynamically measured by the student learning outcomes. By applying data analytics and machine learning, the system can make continual improvement of the effectiveness..

Keywords: e-learning system, adaptive learning, experiential learning, gamification.

## References

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